DAY AND NIGHT THERMAL EXPERIMENT FOR VOLCANO MONITORING

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DANTE (Day and Night Thermal Experiment) is a proposed NASA mission to acquire day and night high spatial resolution thermal data for a two-year mission. The instrument will have a GIFOV of 20 m, a swath width of 400 km, and channels at 0.6-0.9, 8.0-8.5 and 10.2-10.7 um.

The excellent spatial resolution will provide a tremendous opportunity for volcanologists to monitor small, high temperature volcanic features. Many of the world's several thousand active and potentially active volcanoes are in under-developed countries that have poor internal communication and whose geological departments are under-resourced. A globally-applicable observing system from satellites could offer a consistent means of monitoring levels of volcanic activity and would offer some scope for hazard warning. High temperature, small volcanic features include lava lakes, fumaroles, crater lakes, and small lava flows.

Dante will have a 12-bit system, with NEDT of 0.1K in the TIR bands; the dynamic range of the sensor will be 410 degrees. With the lower limit set at 250K (-20C), the upper saturation limit is 660K (390C). This would be the upper temperature for pixels radiating at this temperature. However, small, hot features at the sub-pixel size could be detected, as they would not produce sufficient radiance to saturate.